WACA/WSDOT
Minutes for March 30, 2006 Meeting

Attendees:

Jim Walter, WSDOT	Craig Matteson, Central Pre	Kurt Williams, WSDOT
Don Brouillard, WSDOT	Robert Raynes, Rinker	Tom McGraw, Lafarge
Kurt Siegfried, Rinker	Dick Boss, Cadman	Steve Hiester, Utility Vault
Tom Weist, Utility Vault	Gary Albert, Martin Marietta	Neil Guptill, Glacier NW
Allen Kramer, Lehigh	Mohammad Sheikhizadeh, WSDOT	

Location: WACA's office, 22223 7th Ave. South, Des Moines, WA. 98198

Meeting Minutes:

Date for Next WACA Meetings:
Thursday, May 25th – WSDOT HQ Mats Lab, 9:30 AM – 12:00 Noon

Future WACA Meetings Dates:
October 12, 2006 at WACA's office Des Moines
December 7, 2006 at WSDOT HQ Mats Lab

Issue: Fly Ash, supply and being able to meet WSDOT Std Spec – Kent Balcom.

3/30/06 – Kurt noted that Kent Balcom would not be at the meeting, and note he had forwarded an email from Kent on fly ash supply to WACA. Tom McGraw asked about increasing slag percentages to 35% on a WSDOT project in Blaine. After a brief discussion it was agreed that this proposal would need to be a test section. Kurt said he would contact the FHWA and the HQ Mats lab to see if he could get concurrence for a 35% slag addition to the PCCP. Neil Guptill noted that rail transport is still an issue with fly ash and that the railroad had placed a requirement on the minimum number of rail cars required before the railroad would deliver fly ash.

> ***Action Plan: Update group at next WACA meeting on status of fly ash supply and ability to meet WSDOT Std Spec. – Kent B.***

Issue: Percent Slag allowed in concrete, Sect 6 and 5 of the Std Specs – Rob Shogren.

03/30/06 – Kurt noted that this issue is deferred, and will be covered in the alumina in slag issue dealt with later in these minutes.

> ***Action Plan: Update this issue at next WACA meeting – Jim W./Kurt W.***

Issue: Viscosity Modifying Admixture – Mo Sheikhizadeh.

03/30/06 – Mo noted that Grace had sent a sample of a VMA to the new products committee at WSDOT HQ Mats Lab, but had not filled out the proper paper work. The sample is waiting for the correct paper work to be submitted. Also no sample had been submitted by Degussa.

Action Plan: Continue to give updates to WACA at next Meeting. – Mo S.

Issue: Shrinkage Strain – Mo Sheikhizadeh.
Issue: Cracking in bridges decks. WSDOT is seeing transverse cracks every 4 to 6 feet in bridge decks, even when the bridge decks are properly cured. Test mix has approximately 350 pounds of cement, and with fly ash the total cementitious content is 560 pounds.

03/30/06 – Mo noted that he is concerned with the maximum size aggregate in the 4000D mix can be as small as 3/8 inch. The current Std Specifications do not have a minimum aggregate size requirement. Mo noted he is concerned the smaller aggregate requires more cement paste, which could contribute to the concrete cracking problem. The Group discussed this issue and Craig noted minimum rebar and form clearances in ACI could be contributing to the selection of the aggregate size, and it was noted that ¾ inch rock is getting scarce. Mo noted he wants ¾ inch rock in 4000D. The group discussed and proposed using AASHTO No. 57 gradation, but stated that this would require accepting a minimal amount of 1 inch rock. Mo noted that the concrete cover over the steel and more clearance in the forms would be needed, and he would take this issue to the AGC for their comments.

Action Plan: Continue to give updates to WACA at Monthly Meetings. – Mo S.

Issue: Slag as an alternative on 4000D and 4000P concrete mixes - Mo Sheikhizadeh & High Alumina content in slag & potential for sulfate attack – Kurt W./Jim W.
Issue: WSDOT is concerned that high alumina slag will not mitigate for sulfate attack.

03/30/06 – Kurt noted that he had been working with Rob Shogren on this issue, and a new Std Specification is going to be written that would require sulfate testing in locations where concrete has a potential for sulfate attack. This specification would limit the amount of slag allowed in areas found to have potential for sulfate attack, and may allow an alternate such as proof of mitigation for using slag in areas that have a potential for sulfate attack. A brief discussion revolved around anti-icing chemicals used by WSDOT and Allen Kramer asked for information on anti-icing chemicals used by WSDOT. Kurt emailed the information to Allen on 4/3/06.

Action Plan: Continue to give updates to WACA at Monthly Meetings – Mo S.

Issue: Bituminous Surface Treatment (BST) –Jim W.

03/30/06 – Jim Walter noted that Regions on both the West and East sides of the state will have BST's this season, but he doesn't have specific information beyond that.

Action Plan: Continue to give updates to WACA at Monthly Meetings – Jim W.

Issue: Performance Specifications for Concrete Mix Designs - Mo Sheikhizadeh
Issue: Develop performance specification parameters for concrete that can be developed into specifications.

03/30/06 –Mo said he will bring a proposal on this issue to the next WACA meeting for the group to discuss.

Plan: Update WACA at Monthly Meetings. – Mo S.

Issue: Degradation for concrete Aggregate/Base Course – Jim Walter.

03/30/06 –Jim Walter reviewed notes taken at a meeting between Tom Baker, WSDOT State Materials Engineer, and WACA members. The group discussed this issue at length and Jim W. noted that all the western states use some type of screening test for aggregate. Allen Kramer noted that geologic expertise is needed in this discussion to help define what is considered good or bad basalt. Jim Walter said that WSDOT is preparing to have Bob Gietz, with KBA, perform a durability study that will split aggregate samples and compare the test results from various states to see if there is any correlation with the WSDOT degradation test, see attached handout. Kurt Siegfried asked that pit D345 be included in WSDOT's test and later noted that he would like to see the degradation test as a screening tool, not as an acceptance test for concrete aggregate. Group also discussed that there may be separate degradation limits set for structural concrete and non structural concrete. Robert Raynes asked if industry can contact Bob Gietz to discuss the study as the test progress. Jim Walter responded that it would be fine with him if industry contacts Bob Gietz about the study. Jim noted that there will be no changes in the Degradation specification before the next WACA meeting.

Action Plan: Continue to give updates to WACA at Monthly Meetings. – Jim W.

Reminders:
ASR flow chart - July 2006Amendment to the construction manual. Don B/Kurt W.

New Issues:

Air in Vertical concrete – Neil Guptill.
Neil noted that the air requirement for vertical concrete should be deleted as it is not needed. This would save on cement being used in applications such as barrier, walls and bridge columns. The group discussed briefly and noted that Colorado does not require air in vertical concrete, and Jim W noted that WSDOT had seen problems with bridge rail deteriorating during the ASR study that was attributed to no air. Mo asked

that the group send him research available on this topic, and he would review the information.

Self Compacting Concrete (SCC)/Lean Concrete/CDF/Concrete Cores – Mo

Mo noted that Utility Vault had performed a column segregation test on SCC. This was described in further detail by Tom Weist and noted the SCC Utility vault uses does not have a VMA in it. Mo noted that Utility vault has been provisionally approved to make 3 sided box structures using SCC.

Mo asked the group if the Water/Cement ratio specified in the Lean concrete mixture in Section 6-02.3(2)D, is too high? The group discussed this briefly and the consensus is that the ratio is not too high, unless WSDOT wants a pumpable lean concrete mix, in which case the water cement ration needs to be even higher.

Mo asked the group about a soldier pile concrete mix that could be used in place of CDF. Group discussed this and voiced concerns about meeting the upper strength requirements of the CDF specifications. The lower strength is not a concern. A question was asked, on why set an upper strength limit? Mo explained that the concrete needs to be chipped away from the steel pile. Dick Boss suggested setting a lower strength limit and leaving the upper strength requirement to be dealt with between the concrete supplier and the contractor. Mo asked for a team of people to discuss the soldier pile concrete mix further – Members are Dick Boss, Kurt Siegfried, Craig Matteson, Neil Guptill and Mo. Mo will set a separate meeting to discuss this further.

Mo noted that the compressive strength of cores taken from concrete is currently reduced to 85% of the mix strength, and expressed concern about having the core strength reduced. Dick Boss explained that there was a study done by the Corp of Engineers that defined that bigger cores were needed, in the 6 to 8 inch range, to get a corresponding strength with cylinders made with fresh concrete. Dick noted that the 4 inch cores have a reduced surface area and when the surface area is taken into account along with the aggregate that is cut when the core is taken a reduced strength is needed to make a correlation to a cylinder made with fresh concrete. Mo asked the group to send him any research they had on this subject.

Concrete Certification of Compliance – Kurt

Kurt handed out a copy of Std Spec Section 6-02.3(5)B and a GSP that has different descriptions of what is required on the certificate of compliance for Coarse and Fine aggregates. Kurt noted that the GSP is being inserted on contracts that allow combined gradation, but in reading the GSP he didn't see that there is a need for both the GSP and the Std Spec. Kurt asked the group if there is a way to delete the GSP and modify the language in Std Spec Section 6-02.3(5)B, that would cover both combined gradation and the use of coarse and fine aggregate. The group discussed briefly and agreed to modify the Std Spec language to the following.

6-02.3(5)B Certification of Compliance

The concrete producer shall provide a Certificate of Compliance for each truckload of concrete. The Certificate of Compliance shall verify that the delivered concrete is in compliance with the mix design and shall include:

Manufacturer plant (batching facility)
Contracting Agency contract number.
Date
Time batched
Truck No.
Initial revolution counter reading
Quantity (quantity batched this load)
Type of concrete by class and producer design mix number
Cement producer, type, and Mill Certification No. (The mill test number as required by Section 9-01.3 is the basis for acceptance of cement.)
Fly ash (if used) brand and Type
Approved aggregate gradation designation
Mix design weight per cubic yard and actual batched weights for:
Cement
Fly ash (if used)
Coarse concrete ~~aggregate~~ aggregates and moisture ~~content~~ contents (each size)
Fine concrete ~~aggregate~~ aggregates and moisture ~~content~~ contents
Water (including free moisture in aggregates)
Admixtures brand and total quantity batched
Air-entraining admixture
Water reducing admixture
Other admixture

The Certificate of Compliance shall be signed by a responsible representative of the concrete producer, affirming the accuracy of the information provided. In lieu of providing a machine produced record containing all of the above information, the concrete producer may use the Contracting Agency-provided printed forms, which shall be completed for each load of concrete delivered to the project.

For commercial concrete, the Certificate of Compliance shall include, as a minimum, the batching facility, date, and quantity batched per load.

WSDOT / KBA DURABILITY STUDY

1. The participants and testing to be conducted was outlined as follows
    a. WSDOT to obtain and prepare all samples and to conduct LA, T-85 Index properties, WSDOT T-113 and AASHTO T-210
    b. ODOT will perform AASHTO T-104 & ODOT 208
    c. CalTrans will perform CAL T 229 (T-210)
    d. WFLHD will perform AASHTO T-104 & AASHTO T-210

2. Sampling and source selection:
    a. Obtain materials from current production and utilize sources that are in commercial operation.
    b. Source selection Candidate list of 12 sources was prepared with preferences as to those definitely to be included and others on an optional basis depending on response from contacts. Basis of selection was record degradation results and some experience form previous study. Intended to use range of Deg from moderate to low combined with some lesser wear values.
    c. Source identity will be known but not continued in sample identification.

3. Methods for test and preparation
    a. Use current AASHTO as guide.
    b. Co-operators to be requested to perform single iterations of test. WSDOT to run duplicates of T-113 and triplicates on T 210.
    c. Consider adding DMSO to quarry samples for comparison with previous results.
    d. Based on contact with "co-operators either provide samples as sources are individually processed or possibly wait and transmit *en masse.*

4. Possible schedule and progress
    a. Don to proceed promptly with contact and arrangements
    b. Possible progress and review towards the end of April.

5. Proposed aggregate sources
    a. Primary:
        i. B-335
        ii. V-35
        iii. G-106
        iv. J-145
    b. Optional aggregate sources
        i. FN-77 or R-46
        ii. C-290 or C-44
        iii. AD-178 or GT-329